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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,029	12/20/2000	Guoheng Zhao	M-10696 US	8669

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EXAMINER

SMITH, ZANDRA V

ART UNIT PAPER NUMBER

2877

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/742,029

Applicant(s)

ZHAO ET AL.

Examiner

Zandra V. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-28 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-13, 16, 17, 20, 29-32, 34-37 and 39-54 is/are rejected.
- 7) ☒ Claim(s) 5, 14, 15, 18, 19, 21-22, 33 and 38 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-10, and 39-40 are rejected under 35 U.S.C. 102(b) as being anticipated by *Masao (5,910,841)*.

As to **claims 1, 6, and 39-40**, Masao discloses an ellipsometer using expanded beam, comprising:

directing polychromatic radiation to a structure;

collecting radiation reflected from the structure;

detecting two rays to provide two outputs; and

deriving one or more parameters from the two outputs (col. 4, line 55-col. 5, line 5).

As to **claims 2 and 7**, Masao discloses everything claimed, as applied above, in addition two ordinary and extraordinary rays having orthogonal polarizations result (col. 4, lines 65-67).

As to **claims 3-4 and 8-10**, Masao discloses everything claimed, as applied above, in addition directing and collecting radiation includes passing the radiation through an element having a plane or polarization as claimed (col. 4, lines 65-67 and fig. 5).

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 44, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Masao (5,910,841).

As to **claim 11**, Masao discloses everything claimed, as applied above, with the exception of the numerical aperture of the source and optics, however since it has been held that the selection of a known material on the basis of its suitability for the intended use is within the level of ordinary skill for a worker in the art and since the source and optics inherently have a numerical aperture and since having a numerical aperture as claimed would control the spot size on the surface of the sample, it would have been obvious to one having ordinary skill in the art at the time of invention to include a source and optics with a numerical aperture as claimed.

As to **claims 44 and 50**, Masao discloses everything claimed, as applied above, in addition in another embodiment reflective elements are provided in the detection system (col. 3, lines 48-55). It would have been obvious to one having ordinary skill in the art at the time of invention to include reflective elements in the optical path to combine and direct the light beams to the detector.

Claims 12-13, 16-17, 20, 29-32, 34-37, 41-43, 45-49, and 51-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Masao (5,910,841)*** in view of ***Klein et al. (6,134,011)***.

As to **claims 12 and 16**, Masao discloses an ellipsometer using expanded beam, comprising:

- a source for directing polychromatic radiation to a structure;
- optics for collecting radiation reflected from the structure;
- passing the collected radiation through a first polarizing element;
- a detector for detecting the collected radiation; and
- deriving one or more parameters from the two outputs (col. 4, line 55-col. 5, line 5).

Masao differs in that the angle produced is not altered, however to do is well known as taught by Klein. Klein discloses an optical measurement system that includes a rotating polarizer to alter the angle (col. 4, lines 60-65). It would have been obvious to one having ordinary skill in the art at the time of invention to include a rotating polarizer to alter the angle to ensure that the proper polarization state is maintained after reflection from the sample.

As to **claims 13 and 17**, the system of Masao and Klein discloses everything claimed, as applied above, in addition the angle is one of the claimed values (col. 4, lines 60-65).

As to **claim 20**, the system of Masao and Klein discloses everything claimed, as applied above, with the exception of the numerical aperture of the source and optics, however since it has been held that the selection of a known material on the basis of its suitability for the intended use is within the level of ordinary skill for a worker in the art and since the source and optics inherently have a numerical aperture and since having a numerical aperture as claimed would control the spot size on the surface of the sample, it would have been obvious to one having ordinary skill in the art at the time of invention to include a source and optics with a numerical aperture as claimed.

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As to **claims 29, 30, 32, 34, 35, and 37**, Masao discloses an ellipsometer using expanded beam, comprising:

- a source for directing polychromatic radiation to a structure;
- optics for collecting radiation reflected from the structure; and
- a detector for detecting the collected radiation (col. 4, line 55-col. 5, line 5).

Masao differs from the claimed invention an instrument causing motion between the sample and the system, however to do is well known as taught by Klein. Klein includes a movable illumination system and a movable stage to impart translational and rotational movement and to direct radiation along different optical paths (col. 4, lines 33-37 and col. 6, lines 35-45). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for translation and rotation to provide inspection of the entire surface.

As to **claims 31, 36, 41, 47, and 53**, the system of Masao and Klein discloses everything claimed, as applied above, in addition Klein discloses a conduit carrying a collimated beam of radiation (col. 5, lines 45-52). It would have been obvious to one having ordinary skill in the art at the time of invention to include collimated radiation to ensure uniform intensity reaching the detectors.

As to **claims 42 and 48**, the system of Masao and Klein discloses everything claimed, as applied above, with the exception of an optical fiber in the conduit, however since the use of an optical fiber would prevent light loss it would have been obvious to one having ordinary skill in the art at the time of invention to include an optical fiber.

As to **claim 43**, Masao discloses everything claimed, as applied above, with the exception of an instrument to cause relative motion however to do is well known as taught by Klein. Klein

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includes a movable illumination system and a movable stage to impart translational and rotational movement and to direct radiation along different optical paths (col. 4, lines 33-37 and col. 6, lines 35-45). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for translation and rotation to provide inspection of the entire surface.

As to **claims 45-46 and 51-52**, Masao discloses an ellipsometer using expanded beam, comprising:

a detection system for finding one or more parameters of a structure by directing polychromatic radiation to the structure, collecting and detecting the radiation reflected from the structure;

a first polarizing element; and

a detector (col. 4, line 55-col. 5, line 5).

Masao differs from the claimed invention in that an instrument to cause relative motion is not provided however to do is well known as taught by Klein. Klein includes a movable illumination system and a movable stage to impart translational and rotational movement and to direct radiation along different optical paths (col. 4, lines 33-37 and col. 6, lines 35-45). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for translation and rotation to provide inspection of the entire surface.

As to **claims 49 and 54-55**, Masao differs from the claimed invention an instrument causing motion between the sample and the system, however to do is well known as taught by Klein. Klein includes a movable illumination system and a movable stage to impart translational and rotational movement and to direct radiation along different optical paths (col. 4, lines 33-37

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and col. 6, lines 35-45). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for translation and rotation to provide inspection of the entire surface.

Allowable Subject Matter

Claims 23-28 are allowable over the prior art of record

Claims 5, 14-15, 18-19, 21-22, 33, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, taken alone or in combination, fails to disclose or render obvious directing unpolarized radiation to the sample, a second polarizing element, integral unit, or a radiation reflective element to direct radiation toward the device.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bazin et al. (5,198,875) discloses a device designed to assess the brightness of a surface.

Ausschnitt et al. (6,020,966) discloses a system for enhanced optical detection of minimum features using depolarization.

Fax/Telephone Information

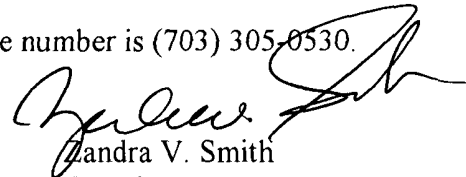
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zandra V. Smith whose telephone number is (703) 305-7776.

The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (703)308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0530.


Zandra V. Smith
Examiner
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October 1, 2002